

REMARKS

Claims 1-44 are pending in the subject application: claims 1-33 have been examined and stand rejected. By the above amendments, claims 1-5, 8, 12-15, 21, and 25-28 have been amended, and new claims 34-44 have been added. Favorable reconsideration of the application and allowance of all of the pending claims are respectfully requested in view of the above amendments and the following remarks.

Formal Matters

Applicant has amended the specification to provide an updated reference to a U.S. patent application that has since received an application serial number and matured into a U.S. patent.

Brief Summary of the Invention

The present invention relates to a technique for selecting operational parameters (e.g., data rate, packet length, signal bandwidth, transmission power, etc.) for transmitting a signal over a communication channel of a network. Based on RF conditions observed from a signal received on the communication channel (e.g., received signal-to-noise ratio, spectral interference analysis, multipath profile, bit error rate, etc.), a preliminary set of parameter values is selected that can be expected to provide good performance. While selecting operational parameters in this manner will generally yield acceptable performance, the preliminary set of parameter values may not be optimal, because the process of selecting the parameter values from observed RF conditions does not necessarily take into consideration how well the entire set of parameters will work together as a whole.

According to the present invention, rather than using the preliminary set of parameter values to actually transmit a signal, the preliminary set of parameters is used to search for a more optimal set of parameter values, which is then used to transmit the signal. More specifically, for each possible combination of operational parameter values (potentially on the order of millions of combinations), an expected performance value or "weight" that takes into account how all the

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parameters will perform together as a complete set is pre-computed and stored in a multi-dimensional table. These pre-computed weights, which indicate the relative expected performance of all possible combinations of parameter values, are determined in advance and are thus, by definition, independent of the observed or current RF conditions.

The preliminary set of parameter values is used to select, from among all the possible sets of parameter values, a subset of candidate sets of parameter values. In particular, only those sets of parameter values that deviate from the preliminary set of parameter value by a predetermined amount (e.g., a certain number of index values) are considered potential candidates for transmitting the signal. Once the candidate sets of parameter values are identified, their relative expected performance weights are compared to find the set of parameter values having the best expected performance among the candidate sets. The selected set of parameter values is then used to transmit the signal on the communication channel. Note that while the candidate sets of parameter values are identified based on the preliminary set of parameter values, because the pre-computed weights are determined in advance and are independent of the current RF conditions, the ultimate selection of a set of parameter values from among the candidate sets of parameter values is independent of the observed RF conditions. By this technique, the set of parameter values is selected in a coordinated manner that takes into account the performance of the parameter values as a complete set, rather than individually.

Prior Art Rejections

Claims 1-33 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,154,489 to Kleider. Applicant respectfully traverses this rejection insofar as it applies to the amended claims.

Amended claim 1 sets for a method of selecting operational parameters for transmitting a signal, including: selecting a preliminary set of parameter values for the operational parameters based on the RF conditions determined from the received signal; using the preliminary set of parameter values to identify candidate sets of parameter values as potential candidates for transmitting the signal, wherein an expected performance value is associated with each of the

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candidate sets of parameters and determination of the expected performance value is independent of the RF conditions determined from the received signal; selecting from among the candidate sets of parameter values a set of parameter values having the expected performance value indicating the highest expected performance among the candidate sets of parameter values, such that selection of the selected set of parameter values from among the candidate sets of parameter values is independent of the RF conditions determined from the received signal; and transmitting the signal on the communication channel using the selected set of parameter values. Independent claims 8 and 21 include analogous requirements.

Kleider does not disclose or suggest using a preliminary set of parameter values to identify candidate sets of parameter values as potential candidates for transmitting the signal and selecting from among the candidate sets of parameter values a set of parameter values having a highest expected performance, such that selection of the set of parameter values from among the candidate sets of parameter values is independent of RF conditions determined from a received signal. Kleider essentially determines operating parameters by observing performance over the communication channel and then adjusting individual operating parameters until expected performance is optimized and then transmits using the updated operating parameters. In sharp contrast, Applicant's claims require selecting a set of parameter values from among candidate sets of parameter values based on a highest expected performance value that is independent of the observed RF conditions on the communication channel. As the Examiner correctly points out, Kleider changes operating parameters based on the channel status, i.e., based on the observed performance of the communication channel (i.e., not independent of RF conditions determined from a received signal). By sequentially making adjustments to various operating parameters in response to the observed channel conditions, Kleider's system fails to compare the expected relative performance of complete sets of different parameters as a whole and suffers from the exact deficiency the invention is designed to overcome. The claimed invention overcomes this problem by basing the ultimate selection of a set of operational parameter values, not on observed channel conditions, but rather on a comparison of the expected performance of a candidate sets of parameter values as a whole, such that the set of parameter values is selected in

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a coordinated manner that takes into account the performance of the parameter values as a complete set, rather than individually. Thus, Kleider does not disclose or suggest the aforementioned requirements of Applicant's claims.

Applicant notes that, as originally presented, claim 1 recited an "initial" set of parameter values. Claim 1 has been amended to now recite a "preliminary" set of parameter values (both of these terms are used in the specification; see, for example, page 20, line 1), and the dependent claims have been amended accordingly. This terminology change is not intended to change the meaning or limit the scope of the claims, as Applicant has used these words synonymously. However, the Examiner apparently equated the "initial" set of parameter values with "initial" operating parameters referred to in Kleider's disclosure, which are used to actually transmit a signal upon start up (see col. 7, lines 51-54). Applicant's claimed "initial" set of parameter values refers to the fact that the set of parameters serve as a starting point in a process of determining an ultimate set of parameter values that will be used to transmit a signal, unlike the Kleider, which refers to initializing parameters at start up, where the initialize parameters are actually used to transmit a signal. The synonymous use of the term "preliminary" helps clarify the meaning of the claim in this regard. In any event, note that all of the claims require the preliminary set of parameter values to be selected based on the RF conditions determined from the received signal. This limitation cannot possibly be suggested by Kleider, since Kleider's "initial" operating parameters are those that are used to send the first signal after start up (i.e., before any other signal has been sent); thus, Kleider's initial operating parameters, by definition, cannot be selected (any, in any event, are not selected) based on RF conditions determined from a received signal, as required by Applicant's claims. For all of the foregoing reasons, the Examiner is respectfully requested to reconsider and withdraw the rejection of claims 1-33.

New Claims

New claims 34-44 each depend from one of independent claims 1, 8, and 21 and should therefore be patentable for at least the reasons set forth above. Claims 34 (34/1), 38 (38/8), and

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(41/21) require that the candidate sets of parameter values be selected from among possible sets of parameter values based on the preliminary set of parameter values.

New claims 35 (35/1) and 42 (42/21) require the RF conditions to be determined at a same node that transmits the signal with the selected set of parameter values, such that the received signal is received by, not transmitted from, the node. Note that independent claim 8 also includes this requirement. This requirement is different from Kleider's scheme, where a separate receiving node 103 determines parameters to be used in transmission and then communicates these parameters back to the transmitting node 101 (see the linkage between channel status estimator 127 and channel status monitor 115 in Fig. 1).

New claims 36 (36/2), 39 (39/12), 43 (43/25) require that the previous set of parameter values used to transmit the received signal be indicated in the received signal. Note that this requirement differs from Kleider's scheme, which requires a rather elaborate system state estimator 125 to determine what parameters were used to transmit a received signal.

Finally, new claims 37 (37/4), 40 (40/14), and 44 (44/27) require the preliminary set of parameter values to be used to index the table of pre-computed weights, such that the candidate sets of parameter values are those within a predetermined number of indices of the preliminary set of parameter values. Support for all of the foregoing claim requirements is found throughout Applicant's specification, and the Examiner is respectfully requested to find these claims allowable.

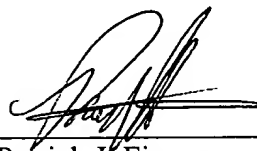
In view of the foregoing, Applicant respectfully requests the Examiner to find the application to be in condition for allowance with claims 1-44. However, if for any reason the Examiner feels that the application is not now in condition for allowance, the Examiner is respectfully requested to call the undersigned attorney to discuss any unresolved issues and to expedite the disposition of the application.

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Filed concurrently herewith is an excess claim fee in the amount of \$198 for payment of eleven claims in excess of the thirty-three previously paid for. Applicant hereby petition for any extension of time which may be required to maintain the pendency of this case, and any required fee for such extension is to be charged to Deposit Account No. 05-0460.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Patrick J. Finnan', is written over a horizontal line.

Patrick J. Finnan

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